

ABSTRACT OF THE DISCLOSURE

A mutant virus is provided which contains a mutation at a phosphorylation site in one or more of the proteins of the virus, which mutation causes the virus to be attenuated, and therefore, an improved vaccine composition can be produced therewith. The invention also relates to vaccine compositions which contain the mutant virus, as well as to methods of inducing an immune response, and of protecting mammals from infection by rabies virus. Also included in the invention are methods of producing the mutant virus and mutant viral proteins, including producing the mutant virus in a host cell which produces or even overproduces a wild-type counterpart of the mutant viral protein, which complements the other viral proteins such that production of the mutant viral particle is optimized. The invention also includes those host cells in which viral production is optimized, as well as vaccine compositions including the viral proteins, either alone or in combination with the intact virus, and to methods of inducing an immune response or protecting a mammal from infection, using the same. Also included in the invention are vectors suitable for delivering a gene to a cell of a human or animal, as well methods of delivery thereof.